AMERICAN DYESTUFF REPORTER

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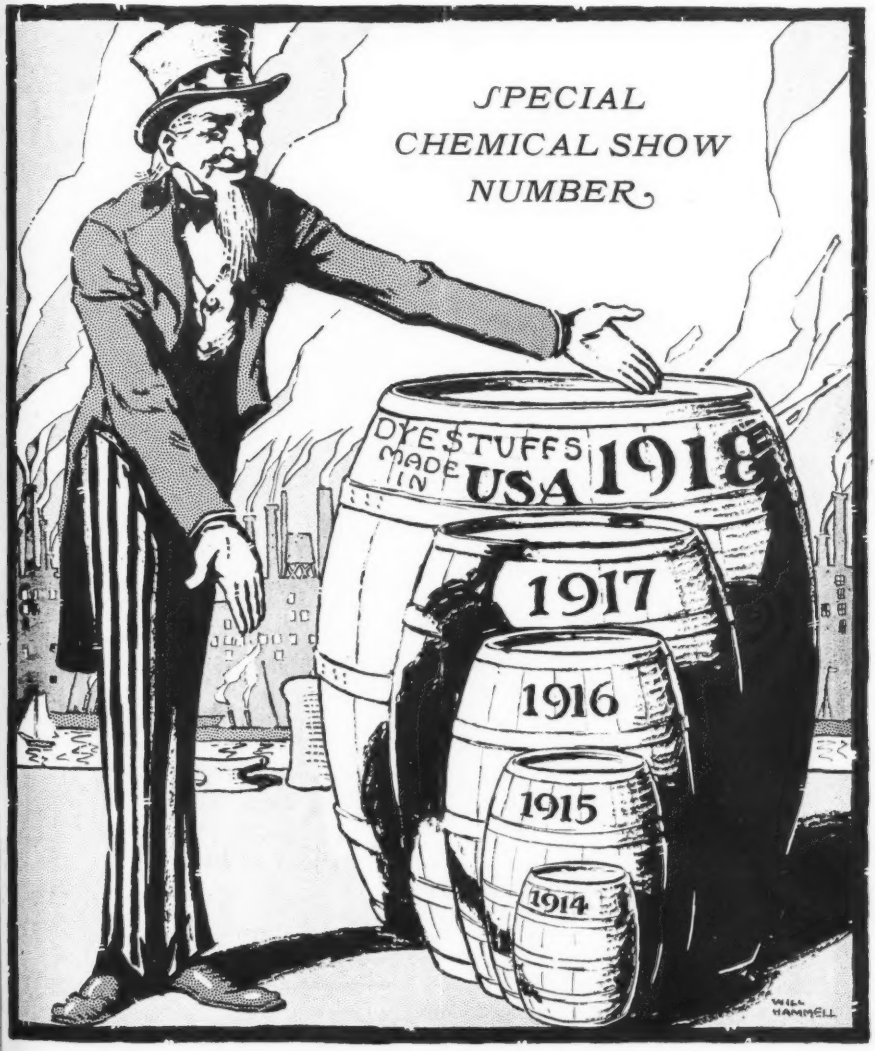

Visitors at the Chemical Exposition

Are cordially invited to inspect our Exhibit at

BOOTHS Nos. 209 and 210

Dyestuffs, Chemicals, Gums, Oils, Tanning Materials, etc.

A. KLIPSTEIN & CO.

644-652 Greenwich Street, New York City

Se

American Manufacturers

of

Ultramarine Since 1872

and of

Aniline Dyes Since 1880

THE HELLER & MERZ CO.

American Ultramarine and Globe Aniline Works

505 Hudson Street NEW YORK

Works: Newark, N. J.

Branches: Boston Chicago Philadelphia

American Made
IMMEDIATELY AVAILABLE

COAL TO DYESTUFF

The high quality of our products is made possible—

First: because the whole process of manufacture is performed by us. This includes:
Mining the coal.
Coking the coal.
Recovery of by-products as Benzol, Toluol, Naphthalene, etc.
Manufacturing from these products the various intermediates required.
The manufacture of the dyes themselves.

Second: a careful standardization before delivery.
This insures uniform shipments so that the user can depend on his colors always coming to him the same.

Third: the policy of "quality first" always, plus the determination to build a permanent 100% American Dyestuff industry.

Our line of colors is now so extensive that we do not publish a list of products but invite your inquiries.

With quality goes service also and our laboratories and chemists are at your service for the submission of your problems or your samples for matching

Newport Chemical Works, Inc.
PASSAIC, NEW JERSEY

NEWPORT TRADE MARK

Works: Carrollville, Wis
General Offices: First Nat'l Bank Bldg., Milwaukee, Wis.

NEWPORT TRADE MARK

Branch Sales Offices: Philadelphia, Pa.; Greensboro, N. C.

AMERICAN DYESTUFF REPORTER

A Weekly Publication devoted to

DYESTUFFS, COLORS and ALLIED CHEMICALS

"Circulated Everywhere Dyestuffs are Used"

Vol. 3 New York, September 23, 1918 No. 13

THE CHEMICAL EXPOSITION

Many Interesting Dyestuff Exhibits — Full List of Exhibitors—Marked Advances Since Last Year

THE National Exposition of Chemical Industries which opens today, September 23rd, in the Grand Central Palace, is the fourth of its kind to be held since the outbreak of the war, and each succeeding year has shown wonderful development in the scope of its interest and usefulness. Its managers have been peculiarly energetic and efficient, and have contrived to make previous expositions—and it is expected that the present one will prove no exception—of very great benefit to the exhibitors from a practical business-producing standpoint and of greater value to consumers in illustrating the strides which chemical development in this country has made since America was thrown upon her own resources.

Commercial expositions of all kinds are, of course, promoted by their managers for the purpose of making money; and no exposition which fails of this object can be considered successful. The fact that the chemical exposition has increased in size and popularity with each succeeding year gives ample testimony to the fact that its managers have been thoroughly satisfied with the pecuniary rewards obtained. But, by the exhibitors and the lay public, expositions of this sort are not viewed as immediate money-makers, but rather as instruments for the obtainment of good will and general publicity for manufactured products and for the spread of information and the general education of the consuming public. More than this, expositions of this kind afford a common meeting-ground where all members of the industry, whether manufacturers, consumers, or those only indirectly associated, may meet and discuss their varied problems in a congenial and informal manner which results in untold benefit to the industry as a whole.

Members of the dyestuff industry who visit the exposition will, of course, be primarily interested in the exhibits of the various dyestuff manufacturers. Of these there are in all fifty-two, although some of these exhibits are those of subsidiary companies included under one head. Probably in no branch of the chemical industry has such great progress been made within the last few years as in the manufacture of dyestuffs. This is, of course, natural, because of the fact that until the outbreak of the war America was almost exclusively dependent upon Germany, but it testifies none the less to the energy, persistence and resource of our dyestuff chemists and to the courage and fore-

sight of the individuals who supplied the capital to make possible the development of this newest of American industries.

Visitors to the exposition who are interested in dyestuffs will find ample material to occupy their time and attention. Never before has there been gathered under one roof anything to approach the showing of bases, intermediates and dyestuffs of American origin, as well as all manner of samples of finished goods in the coloring of which these products have been used.

We have been privileged to examine in advance the exhibits of many of the dyestuff manufacturers, and are satisfied that they will prove of very unusual interest to the consumers who visit the exposition. Some, of course, are of much greater pretensions than others, but even the smallest of them will be found to have interesting and noteworthy features. An especially interesting feature of the exposition will be a bull's-eye label which will be attached to all products which have been developed in the United States since the outbreak of the war. Within this classification practically all finished dyestuffs and a great majority of intermediates will be classed. In this way the layman will be able to see at a glance the progress which has been made by the American dyestuff industry since the outbreak of the war.

On the following pages will be found some special account of many of the dyestuff exhibits. From those firms who are not mentioned we have failed, up to the time of going to press, to receive details of their exhibits. The following is a list of the manufacturers of dyestuffs and allied products who are making exhibits at the exposition:

LIST OF DYE MANUFACTURERS WHO WILL EXHIBIT

American Aniline Products, Inc.,
80 *Fifth Avenue, New York.*
Apex Chemical Co., Inc., The,
Pulitzer Building, New York.
Arnold, Hoffman & Co.,
61 *Broadway, New York.*
Bachmeier & Co.,
438 *West 37th Street, New York.*
Barrett Co., The,
Whitehall Building, New York.
Bound Brook Chemical Co., The,
Bound Brook, N. J.
Butterworth-Judson Corporation, The,
61 *Broadway, New York.*
Campbell, John, & Co.,
75 *Hudson Street, New York.*
Chemical Co. of America, The,
28 *Platt Street, New York.*
Chromos Chemical Co., The,
Aeolian Bldg., 42nd St., New York.
Crescent Color & Chemical Co.,
11th Ave. and 59th St., New York.
Dow Chemical Co., The,
Midland, Mich.
Drackett & Sons, P. W.,
Cincinnati, Ohio.
Du Pont, E. I. de Nemours & Co.,
Wilmington, Del.
Dye Products & Chemical Co., The,
200 *Fifth Avenue, New York.*
Edison International Corporation, The,
165 *Broadway, New York.*
General Chemical Co., The,
25 *Broad Street, New York.*
Heald & Co., John H.,
Lynchburg, Va.
Hellenic Chemical & Color Co., Inc., The,
1 *Cedar Street, New York.*
Hemingway, Inc., Frank,
115 *Broadway, New York.*
Imperial Color Works,
Glens Falls, N. Y.
Imperial Dyewood Co.,
Marbridge Building, New York.
Independent Chemical Co.,
72 *Front Street, New York City.*
Innis, Speiden & Co.,
46 *Cliff Street, New York.*
King Chemical Co.,
72 *Front Street, New York.*
Kalbfleisch Corporation, The,
31 *Union Square, New York.*
Klipstein & Co., A.,
644 *Greenwich Street, New York.*
Marden, Orth & Hastings Corporation, The,
61 *Broadway, New York.*
Metz & Co., Inc., H. A.,
122 *Hudson Street, New York.*
National Color & Chemical Co.,
11th Ave., and 59th St., New York.

National Gum & Mica Co.,
11th Ave. and 59th St., New York.

National Aniline & Chemical Co., Inc.,
21 Burling Slip (foot of John St.) New York.

Newport Chemical Works, The,
Passaic, N. J.

Obex Co.,
11th Ave., and 59th St., New York.

Peerless Color Co.,
72 Front Street, New York.

R. U. V. Co. ,The,
165 Broadway, New York.

Semet-Solvay Co., The,
Syracuse, N. Y.

Solvay Process Co.,
Syracuse, N. Y.

Seydel Manufacturing Co., The,
86 Forrest Street, Jersey City, N. J.

Stamford Extract Co., The,
82 Wall Street, New York.

Stein, Hall & Co., Inc.,
61 Broadway, New York.

Sterling Color Co., The,
72 Front Street, New York.

Takamine Laboratories, Inc., The,
120 Broadway, New York

Warner Chemical Co., The,
52 Vanderbilt Avenue, New York.

Warner-Klipstein Co.,
52 Vanderbilt Avenue, New York.

Williamsburg Chemical Co., The,
230 Morgan Avenue, Brooklyn, N. Y

Wolf & Co., Jacques,
Passaic, N. J.

Some of the more interesting of the dyestuff exhibits are described in the following paragraphs:

E. I. du Pont de Nemours & Co.

The exhibit of the du Pont Allied Industries will occupy booths Nos. 7-8-9 on the first floor. Exhibits of the products of all the associated companies will be shown. These include explosives made by E. I. du Pont de Nemours & Co.; Pyroxylin and coal tar chemicals by the du Pont Chemical Works; leather substitutes by the du Pont Fabrikoid Company; Ivory Py-ra-line and "Challenge" collars by the Arlington

STERLING COLOR CO. *Inc.*

72 Front Street, NEW YORK

Sales Agents for

Peerless Color Co., *Inc.*

Bound Brook, N. J.

DIRECT FAST COTTON COLORS

Booths Nos. 565 and 566

Works; paints, pigments, acids and chemicals by the Harrison Works; and coal tar dyestuffs by the du Pont Dye Works.

The dyestuffs exhibit will include a very unusual showing of intermediates upon which particular stress is being laid by the du Pont Company. There are also to be shown a number of finished dyestuffs which the company is now marketing commercially. The company will make no effort to show dyed samples or products in which their colors have been used. Following is a list of the dyes and intermediates which will be included in the du Pont dyestuffs exhibit:

DYESTUFFS

du Pont Indigo 20 per cent Paste
Pontachrome Yellow GG
Pontachrome Brown 3G Paste
Pontachrome Brown MW Paste
du Pont Orange II Conc.
du Pont Azo Carmine
du Pont Scarlet GR Ext.
du Pont Malachite Green
du Pont Crystal Violet Pd.
du Pont Victoria Blue BX
du Pont Victoria Blue B Base
du Pont Chrysoidine R
du Pont Auramine O
du Pont Rhodamine B
du Pont Paper Blue R Conc.
du Pont Phloxine
du Pont Spirit Scarlet B Ext.
Sulphogene Black GX
Sulphogene Khaki GX
Pontamine Yellow CH
Direct Sky Blue
Direct Blue BB
du Pont Acid Violet 10 B

INTERMEDIATES

Diethylaniline
Monoethylaniline
Paranitrotoluolsulphonic Acid
Orthonitroanisol
Orthoanisidine
Diethylaniline Sulphonic Acid
Diethyl-meta-amido-phenol
Benzyl methyl aniline
Phenyl naphthylamine
Paranitrophenetol
Paraphenetidine
Michler's Ketone
Tetra methyl diamino diphenylmethane
Tetra methyl diamino diphenyl benzhydrol
Diamino Stilbene Disulphonic Acid
Ethyl Bromide
Dichlorphthalic Acid
Dichlor Fluoresceine
Nitrobenzol
Diphenylamine
Phthalic Anhydride
Dinitrotoluol
Denzidine
Meta phenylenediamine
Meta toluylenediamine
Orthonitrophenol
Paranitrophenol
Dianisidine
Dimethylaniline
Monochlorbenzol
Dichlorbenzol
Mononitrochlorbenzol
Dinitrochlorbenzol
Dinitrophenol
Dehydrothiotoluidine
Mononitrotoluol
Orthonitrotoluol
Paranitrotoluol
Orthotoluidine
Paratoluidine
Paranitrotoluol Sulphonic Acid
Dinitrobenzol
Metaphenylenediamine
Metatoluylenediamine
Picramic Acid
Benzaldehyde
Benzoic Acid
Salicylic Acid
Sulphanilic Acid
Nitrosophenol

FRED WETZEL & CO. N.Y.

Nitrosocresol
Paramononitrochlorbenzol
Orthomononitrochlorobenzol
Mononitrophenylene
H Acid
Peri Acid
Laurent's Acid
Cleves' Acid
1:5 Oxy Acid
Silver Salt

NATIONAL ANILINE & CHEMICAL CO., INC.

This concern will occupy booths Nos. 16-17-18 and one-half of No. 15, on the first floor. The exhibit will be similar to that displayed at the recent Textile Show, which excited such favorable comment among visitors, and which has since been exhibited at several different cities throughout the United States. The chief distinction between the present exhibit and the one at the Textile Show will be that more attention will be given to the chemical side (intermediates, dyestuffs, etc.), and less to the textile side. The revolving stands of comparative tests of German and American dyes will again be shown and the miniature laboratory will be in operation. The following extract taken from a booklet which will be distributed at the exposition gives the chief details:

"The group of large display bottles contains product samples of dyestuffs as they are produced at the several works of the company. To this array of dyes there are being added at frequent intervals new products to which the attention of the dye-consuming public is promptly directed. In the five large jars there are shown dyestuffs of the greatest importance, viz.: synthetic indigo, alizarine, hydron blue, patent blue, and alizarine cyanine. The production of these dyestuffs marks great strides in the development of the American dyestuff industry. The remainder of this elaborate display comprises coal-tar coloring matters that find extensive application wherever colors are employed. The groups include important representatives of the acid colors, direct colors, developed colors, and important range of sulphur colors, chrome colors—among which are to be included some of the fastest known dyes for wool—basic colors, together with some dyes of limited though important application that are used in non-textile industries.

"The manufactured goods forming part of this exhibit have all been dyed with 'National' colors. These exhibits have been loaned by various mills using our products, for the purpose of showing that American manufacturers of textiles have promptly availed themselves of the opportunity of using American made dyes, and find that they meet the usual requirements of the trade. These exhibits include hosiery of various kinds, flannels, shirtings, dress goods, fabrics for men's wear, military cloth of various kinds used in the army and navy, mercerized cotton, shoddy, silk goods, leather, etc. All these have been dyed with colors produced by the National Company, and practically demonstrate the wide adaptability of its products for every phase of textile and allied fields.

"Special interest is attached to the sample of mauve, displayed in the brass

Visit our exhibit at the

Fourth National Exposition of Chemical Industries

Frank Hemingway, Inc.
115 Broadway, New York

Manufacturers
Dealers
Exporters
Importers

Dyestuffs
Coal Tar Bases & Intermediates
Heavy and Miscellaneous Chemicals
Pharmaceuticals

Victoria Blue B
Victoria Blue Base
Crystal Violet 6 B
Crystal Violet 6B Conc.
Chrome Brown B
Chrome Yellow 2G
Benzidene Sulphate
Benzidene Base
Dinitro Benzol
Picramic Acid
Chlorosulphonic Acid
Benzyl Chloride

PARANITRANILINE

Butterworth Judson Corp.
61 Broadway, New York

WORKS:
NEWARK BALTIMORE
BOSTON

case, which was dyed by Sir William Henry Perkin, the English discoverer of the first coal tar color, over fifty years ago. The dyeing was presented to William J. Matheson, president of the National Company, by Sir William Henry Perkin in 1906.

"Forming part of the general exhibit is a working unit of a fully equipped color testing laboratory identical with those in operation in daily use in the laboratories of our works and branches. During the exhibition actual practical comparative dye trials are made upon cotton, wool and other textiles. These tests are for the purpose of demonstrating the methods followed in modern color laboratories, and also show in a practical manner that dyes of coal tar origin now made in America are the equal in shade, strength, working qualities and fastness of dyes of the same class that were formerly imported from Germany.

"The dyed samples displayed on two revolving stands present to the public the general facts regarding the relative fastness of some of the dyes made by the National Company and dyed parallel with dyes of known German origin of the same class. This special exhibit will show that all dyes now regularly manufactured by this company possess the same degree of fastness to light, weather, scouring, fulling, etc., as dyes of the same class of German origin that were formerly imported into this country. These dyeings of American colors, which are displayed side by side with the similar German ones, have previously been subjected to the same tests. It is believed that this feature, in conjunction with the remainder of the exhibit, will demonstrate that the promise of this country to place on the American market an adequate and comprehensive line of satisfactory colors is being fulfilled."

The exhibit will, as formerly, be in charge of Dr. Louis J. Matos and a competent corps of assistants.

NEWPORT CHEMICAL WORKS, INC.

The exhibit of the Newport Company this year will not be very extensive, so far as finished dyestuffs are

concerned. The chief aim of this company will be to show by ocular demonstration the independence of this country, and of the Newport Company in particular, in the field of aniline dye making. The possibility of producing practically any shade on any class of material with American-made dyes will be demonstrated, as will also the company's complete independence all the way from the basic raw material—coal —to the finished dyestuffs. The Newport Company is rapidly adding new colors to its list, and in the very near future will be able to show products which have not previously been manufactured in this country.

A. Klipstein & Co.

The exhibit of A. Klipstein & Co. will occupy booths Nos. 209 and 210. It will consist primarily of product samples of various chemicals, gums, dyestuffs, oils, glycerines, tanning materials, softeners and finishers handled by this firm.

The dyestuff section will also include dyed samples of colors made in America by the Bulls Ferry Chemical Company and E. C. Klipstein & Sons Company, as well as those imported from Switzerland, which are the product of the Society of Chemical Industry in Basle, who are the largest producers of synthetic indigo in the world, and for which concern A. Klipstein & Co. are sole American selling agents. The exhibit will be under the supervision of E. H. Klipstein.

Butterworth-Judson Corporation

The exhibit of the Butterworth-Judson Corporation will occupy booths Nos. 469 and 470 on the third floor, and will include type samples of the following products made by this concern:

Victoria Blue "B," Victoria Blue Base, Crystal Violet Stand., Crystal Violet Conc., Crystal Violet Base, Metachrome Brown, Dinitro Benzol, Benzidine Base, Benzidine Sulphate, Picramic Acid, Benzyl Chloride, Ortho Nitro Phenol, Para Nitro Phenol, Michler's Ketone, Phosgene, Paranitraniline, Chlorsulphonic Acid, Salicylic Acid, Alpha Naphthylamine, Sulphuric Acid, Muriatic Acid, Nitric Acid, Salt Cake, Nitra Cake, Nithopone.

The Barrett Company

The exhibit of the Barrett Company will occupy booth No. 24, where a number of products produced and handled by the Chemical Department will be shown. The exhibit will be primarily educational in character with a view to appealing to the lay as well as to the technical visitors. There will be shown again this year an illuminated coal-tar chart with a great number of actual samples of materials obtained by the destructive distillation of coal. This chart, when shown at last year's exposition, excited considerable comment. There will also be shown samples of a number of refined coal-tar products which enter into the dyestuff and phar-

FRED WETZEL & CO. N.Y.

OUR forty-two years' experience in the dyestuff industry guarantees you a superior product.

Send us your problems in dyeing. The result of our experience is at your service.

Colors of our manufacture

CAMEL BRAND DYES

are equal to pre-war standards.

On display in Booths 489 and 490, Fourth National Chemical Exposition, Grand Central Palace, New York, N.Y.

JOHN CAMPBELL & CO.

75 Hudson Street
New York, N. Y.

Newark Philadelphia Providence
Boston Toronto

Established 1876 Incorporated 1907

HOLLIDAY-KEMP CO.

INCORPORATED

MANUFACTURERS OF

Aniline Colors Dyestuffs and Intermediates

WORKS
WOODSIDE, L. I.

OFFICES:

90 William Street
New York City

114 State Street
Boston, Mass.

151 N. Front Street
Philadelphia, Pa.

maceutical fields as crudes, showing in connection with these samples, by means of cards connected by ribbons to the jars which contain them, the various steps through which these so-called crudes must pass before reaching the final finished dyestuff or pharmaceutical product.

There will also be shown an interesting service flag bearing six stars, each star containing the names and representing six extremely important products of the Barrett Chemical Department which enter into the manufacture of explosives. This flag will be especially interesting at this time as a "win-the-war" feature. From the various stars ribbons will lead to placards showing the names of the actual explosives as they are used by the United States and Allied governments. There will also be shown a product cabinet which will contain several products which the Barrett Company is particularly endeavoring to promote at this time, these products representing in most instances very recent developments in the chemical industry. The exhibit will be under the direction and in charge of H. S. Sidebottom, technical service manager of the Barrett Chemical Department.

Semet-Solvay Company

The exhibit of the Semet-Solvay Company and its contemporary, the Solvay Process Company, will be shown in booths Nos. 10 and 11. The materials which will be exhibited will be coal and the products of its distillation as produced by the By-Products Coke Company, together with various materials manufactured from them. These products will include Coke, Light Oils, Tar, Ammonia, Ammonium Chloride, Ammonium Bicarbonate, Ammonium Sulphate, Carbolic Acid, Picric Acid, Ammonium Picrate, Trinitrotoluol, Benzoic Acid, Benzaldehyde, Benzyl Chloride and Salicylic Acid. There will also be shown some data on the "Safety First" work in their plant, and an outline of the progress of manufacture through samples of crude materials and finished products, arranged in their order of sequence.

John Campbell & Co.

The exhibit of John Campbell & Co. will occupy booths Nos. 489 and 490. The exhibit will include a complete line of the following series of colors of this firm's manufacture: Aceko Series (standard acid colors for wool and silk), Amidine Series (direct cotton colors), Krameko Series (fast chrome colors for mode and Government shades), Amalthion Series (sulphur colors), as well as a complete line of basic colors.

Seydel Mfg. Co.

The exhibit of the Seydel Mfg. Co. will occupy booths Nos. 272 and 273. It will comprise an exhibit of Benzoic Acid, Benzoate of Soda, and a complete line of Medicinal Benzoates, including, particularly, Benzyl Benzoate, which is most prominent because of discoveries made by Dr. David I. Macht, of Baltimore, that this product is an excellent substitute for opium alkaloids in the treatment of smooth muscles. The feature of the Seydel Benzoate line is that

BACO
Reg. U. S. Pat. Off.
DYES
ALWAYS THE SAME
AT THE CHEMICAL SHOW, WEEK OF SEPTEMBER 23RD
BACHMEIER & CO., Inc.
438 W. 37th Street
NEW YORK, N. Y.
Branch Offices:
261 Franklin Street, Boston
1524 Chestnut St., Philadelphia

all products are guaranteed free from chlorine.

There will be shown also samples of the following Furamine Dyes: Furamine D (black), Furamine DB (blue black), Furamine P (blue), Furamine GG (yellow), Furamine A (bluish black of exceptional tone and excellent dyeing qualities). Type samples of the above products will be shown representing actual plant production. The results obtained with Furamine dyes will be illustrated by a collection of valuable furs.

AMERICAN ANILINE PRODUCTS, INC.

The exhibit of American Aniline Products, Inc., will occupy booths Nos. 201-2-3-4-5. The exhibit will include both type and dyed samples of various products manufactured by this concern, special emphasis being laid on khaki and navy dyes for Government work. Managers from the New York, New England and Southern offices of the concern will be in attendance at the exhibition.

JACQUES WOLF & CO.

The exhibit of Jacques Wolf & Co. will be shown in booths Nos. 423 and 424 on the third floor, and will include the following products: Alizarine Yellows and Chrome Black, especially suited for khaki shades; Hydrosulphite A. W. C., a substitute for Rongalite C; Monopole Oil for finishing purposes; Benzapol for wool scouring; Textile Gum for fabric printing; Sulphur Black and a full line of softeners and finishing preparations for cotton, wool and silk.

THE DOW CHEMICAL COMPANY

The exhibit of the Dow Chemical Company will occupy booth No. 87, and will consist of nearly seventy different chemicals manufactured by this concern. Particular emphasis will be laid on Dow Synthetic Indigo and Dow Dibromindigo and the various intermediates manufactured by this concern.

THE KALBFLEISCH CORPORATION

The exhibit of the Kalbfleisch Corporation will occupy booths Nos. 555 and 556 on the third floor, and will include particularly samples of the different grades of Sulphate of Alumina used for the purification of water, paper sizing, dry colors, etc.; also samples of Salt Cake used in the manufacture of glass and paper makers' Sulphate or Kraft Pulp. Samples of Sulphuric, Nitric and Muriatic Acids and Aqua Ammonia, which are at the present time in great demand for war purposes, will also be shown. A specialty worthy of note is the pure anhydrous Sulphate of Soda manufactured by this concern which has great possibilities in the standardization of aniline colors.

FRANK HEMINGWAY, INC.

The exhibit of Frank Hemingway, Inc., will consist of dyestuffs, intermediates, chemicals and pharmaceuticals handled by this firm. The following dyestuffs in particular will be featured: Victoria Blue, Crystal Violet, Meta Chrome Brown, Chrome Brown and Chrome Green. The dyestuff section of the exhibit will be in charge of Thos. F. O'Keefe, the intermediate section in charge of H. H. Foster, and the chemical section in charge of Howard A. Ambruster.

BACHMEIER & CO., INC.

The exhibit of Bachmeier & Co., Inc., will occupy booth No. 502, and will include a full line of their Baco dyes. These colors, although not manufactured by this concern, have all been subjected to rigorous tests at the Baco Laboratories, and are standardized under a rigorous policy of "always the same."

THE CHEMICAL COMPANY OF AMERICA

The exhibit of the Chemical Company of America will occupy booths Nos. 279-280-81-82, and will include samples of an excellent khaki color, as well as the following chemicals:

Nitro Benzol, Aniline Oil for Red, Benzidine Sulphate, Benzaldehyde, Monoethylaniline, Metaphenylenedia-

FRED WETZEL & CO. N.Y.

mine, Paranitrotoluol, Paranitracetanilid, Aniline Oil, Benzidine Base, Benzyl Chloride, Diethylaniline, Metatoluylenediamine, Mixed Toluidine, Paraphenylenediamine, Paramidophenol Base, Paramidophenol HCL.

The exhibit will be in charge of Messrs. Kendall and Christ.

STEIN, HALL & CO.

The exhibit of Stein, Hall & Co., in booths Nos. 211 and 212 on the mezzanine floor, will be devoted to the chemicals and starch products manufactured by this company, and will be in charge of Lewis W. Peabody.

INNIS, SPEIDEN & CO., INC.

The exhibit of Innis, Speiden & Co., Inc., will feature the following products manufactured and handled by this concern: Heavy Chemicals, Waxes, Gums, Silicas and Leather Specialties.

GENERAL CHEMICAL COMPANY

The exhibit of the General Chemical Company will occupy booths Nos. 53 and 54, and will consist of samples of the following products manufactured by this concern: Commercial Acids, C. P. Acids and Ammonia, Reagent Chemicals, Aium, Alumina Sulphate, Ammonia, Acetyl Chloride, Copper Sulphate, Iron Salts and Solution, Lead Acetate, Magnesium Salts, Sodium Salts and Solution, Sulphur, Tin Salts, Sulphate of Zinc, etc.; also "Orchard" Brand Insecticides and Fungicides, "Lariat" Brand Cattle Dips and "Ryzon" Baking Powder.

The exhibit is in charge of N. Peterkin and a number of representatives of the sales department.

CHROMOS CHEMICAL COMPANY, INC.

The exhibit of the Chromos Chemical Company, Inc., will consist of a display of Benzoic Acid, U. S. P.; Benzoate of Soda, U. S. P., and Benzyl Chloride, all of which products are manufactured by this concern.

THE STAMFORD EXTRACT MFG. CO., INC.

The exhibit of the Stamford Extract Mfg. Co., Inc., will be confined to an exhibit of samples of various logwood and other natural dyestuffs manufactured by this concern, as well as samples dyed therewith. The exhibit will be in charge of H. S. Stanley.

WILLIAMSBURG CHEMICAL CO., INC.

The exhibit of the Williamsburg Chemical Company, Inc., will occupy booths Nos. 294 and 295, and will include both type and dyed samples of the colors manufactured by this concern. A particularly noteworthy feature of the exhibit will be samples of special work done by customers of the Williamsburg Chemical Company. The exhibit will be in charge of Chas. L. Hirsh.

APEX CHEMICAL COMPANY, INC.

The exhibit of the Apex Chemical Company, Inc., will occupy booth No. 471, and will include a line of chemical products used by the leather, textile and allied industries, as well as materials which have been treated with these products. A particular feature will be made of the following: Antimonelle, a substitute for Tartar Emetic, which is materially cheaper; Orthophene Bate, a product which takes the place of animal

PARAPHENYLENEDIAMINE BASE
FUCHSINE CRYSTALS
METHYLENE BLUE
METHYL VIOLET
ZOBEL
Manufactured by
ZOBEL COLOR WORKS
Sales Office: 38 Water St., New York Factory: Brooklyn, N. Y.

dungs for delining hides and skins; Lactic Acid Refined, a quality lighter in color than the usual commercial lactic acids.

Imperial Color Works

The Imperial Color Works, in conjunction with its associated companies, the Imperial Dyewood Company, both of Glens Falls, and John H. Heald & Co., Inc., of Lynchburg, Va., will cooperate in an exhibit of dry and pulp colors and dyewood extracts. There will be shown dry pigment colors for the paint, printing ink, and kindred trades, and pulp pigment colors for the surface coating and paper mills trade. As a part of the exhibit will be shown Alizarine Yellow GG and R, products which have been developed by the Imperial Color Works and improved for wool dyeing for army khaki.

Dyewood products shown by the Imperial Dyewood Company and Messrs. Heald & Co. will include, logwood, hypernic, fustic and hematine in both crystal and paste forms.

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OIL ORANGE
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OIL BROWN
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We Can Match Special Colors

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There will also be shown dyed samples colored with the various products above mentioned.

The R. U. V. Company, Inc.

The R. U. V. Company, Inc., will exhibit in booth No. 421 their quartz mercury vapor lamp and their Ultra Violet Ray Laboratory Outfit, using this lamp as the source of Ultra Violet Rays. This outfit for the production of Ultra Violet Rays has some new features in the electrical control of the lamp, and the lamp itself is of a great deal of interest in showing the latest and most adaptable source of this form of light. Ultra Violet Rays have been proven to be exceptionally satisfactory in testing dyed samples for fastness to light, and an inspection of this outfit by consumers of dyestuffs should be interesting from this angle. The exhibit will be in charge of Mr. Ricord.

Sterling Color Company

The exhibit of the Sterling Color Company will occupy booths Nos. 565 and 566. The products shown are Direct Fast Cotton Colors applicable to cotton and mixed goods where fastness to perspiration, acids, alkalies and other reagents are required. Sulphur Khaki for Government work will also be shown. These colors are the products of the Peerless Color Company, Bound Brook, N. J. One of their first efforts was Primuline, a fast red for cotton and silk. The exhibit will be in charge of Messrs. A. L. Benkert, Thos. F. Sullivan and A. Mainland.

Dye Products & Chemical Co., Inc.

The exhibit of the Dye Products & Chemical Company, Inc., will consist of a display of dyestuffs and intermediates manufactured by this concern at their plant in Newark, N. J. A feature of the exhibit will be a display of the intermediates used for the manufacture of khaki dyestuffs for the United States Government uniforms, showing the various steps necessary in the manufacture of these materials.

The exhibit will be in charge of Messrs. Sidney Simon, L. M. Lowenthal and Clarence K. Simon.

THE WARNER CHEMICAL COMPANY

The Warner Chemical Company, in conjunction with the Warner-Klipstein Chemical Company, will occupy booths Nos. 561-2-3. The exhibit will include products of both concerns, which are composed principally of various chlodine products used medicinally and for military purposes, and phosphates of soda, which are used for the medical trade and for food products. There will also be shown the Nelson Electrolytic Cell, which was designed and perfected by the Warner Company for the manufacture of chlorine gas and caustic soda from common salt.

HELLENIC CHEMICAL & COLOR CO., INC.

The exhibit of the Hellenic Chemical & Color Company, Inc., will consist of both imported and domestic dyes, dry colors and chemicals handled by this concern. Dyes of various types for all materials will be shown.

FAST AMERICAN DYES ARE HERE

An interesting announcement appearing in connection with the coming Chemical Show is that from the National Aniline & Chemical Company, Inc., that it is now producing in limited quantities two most important fast colors for which the textile industry has been waiting, namely, Alizarine Sapphire and Carbanthrene Blue. Alizarine Sapphire is the fastest known level acid dye to light for wool, and Carbanthrene Blue a vat dye of the greatest fastness to washing for cotton.

Alizarine Sapphire, because of this fastness, will find extensive application on women's dress goods as a component color in such fashionable shades as *Taupe, Bear, Rodent,* etc. These are the shades which have occasioned most of the complaints received by the department stores and other retailers, since the blue that was used in making these shades faded more rapidly than the other colors of the compounds. Now, however, it is only a question of time until Alizarine Sapphire will replace the blue now being used on the higher grade of goods. This dyestuff also is used extensively as a straight blue shade on all work that requires extreme fastness to light, notably flags.

Carbanthrene Blue, as stated above, is extremely fast to washing when applied to cotton. It will not fade under even the most vigorous laundry methods. It is almost impossible to remove this color once it is properly applied.

The importance attached to these two colors is shown by the fact that the National Aniline & Chemical Company has already spent several hundred thousands of dollars in research work and plant investment. The introduction of these types, together with *Indigo* and *Alizarine,* already announced, and some twenty other fast colors already largely produced by this company, means that every reasonable demand for fast colors has been met. In 1918 these two products will be available in large quantities.

Karl Feldman, of the Berlin Aniline Works, has been interned at Fort Oglethorpe, Ga., because of his pro-German activities.

American Aniline Products, Inc.
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Factories:
Harrison, N. J. **Nyack, N. Y.**

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Amanil Brown RC
Amanil Fast Grey BR
Amanil Geranine BB

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Sulphur Yellow R
Sulphur Yellow Brown GG
Sulphur Yellow 3B
Sulphur Black RN

ACID
Amacid Fast Yellow R
Amacid Fast Brown G
Amacid Cloth Red B
Amacid Blue Black KN

CHROME
Alizarine Yellow 3G
Alizarine Brown G
Amacid Chrome Red BB
Alizarine Blue Black BB

New England Office:
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A. P. HOWES, Editor and Publisher

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GREETINGS AND CONGRATULATIONS

On this, the occasion of the Fourth National Exposition of Chemical Industries, the AMERICAN DYESTUFF REPORTER wishes to extend to all members of and associates in the dyestuff industry a cordial greeting. This is a time for mutual congratulations. The way has been long, the path none too smooth, and the end is not yet; but at least we are in sight of the goal. Many obstacles remain to be overcome, but the achievements of the past four years make it certain that they will be met and vanquished with characteristic American energy and thoroughness.

Four years of arduous labor on the part of our dyestuff chemists and those who have so courageously and indefatigably supported their efforts have developed in this country a dyestuff industry second to none in the world. As a dyestuff-producing nation we were, four years ago, at the bottom of the list of great world powers. Even the Teuton at the heyday of his success never included within his borders a dyestuff industry equal in money value to that of our own to-day. According to the latest Government figures, we are to-day exporting more dyestuffs in value than we ever imported from Germany—this in addition to supplying nine-tenths or more of our own domestic consumption.

It is true that we have not as yet produced all, or in fact any very considerable percentage, of the rarer and more difficult colors that were formerly produced in Germany, but our failure to so produce them has been owing more to the restrictions on necessary basic products for war purposes than to inability on the part of our chemists to surmount the obstacles in the way of their production. Each succeeding week sees new colors added to the list, and there is now no question that within a reasonable period of time we shall be able to produce in this country, entirely independent of any foreign assistance, colors of all classes, equal in every respect to those for which we were wont to depend upon the Germans.

It is, indeed, a remarkable achievement. Those who shake their heads and voice a doubt as to the permanency of the American industry—and there are still many of them—can no longer be taken seriously. The many millions of invested capital, the high standing of the individuals and firms engaged, and last, but not least, the remarkable resource and perseverance of American chemists, insures beyond the question of a doubt the ultimate permanent establishment in this country of a dyestuff industry second to none other in the world.

GERMAN ACTIVITIES IN THE DYESTUFF FIELD

Repeatedly in these columns we have warned against those who, posing as loyal Americans, are in reality "camouflaged" enemies. Unfortunately, the dyestuff industry has more than its share of persons of this class. We are, personally, firmly convinced—although we lack proof—that some of our most prominent manufacturers of and dealers in dyestuffs have Teutonic souls. We esteem it the highest mission of this magazine to search for and turn the light of publicity upon all such traitors. Those of our friends who can assist us in this work by giving us their suspicions, or, better yet, concrete proof, of Teutonic activity in the dyestuff field, will incur our deepest gratitude, and through them we may be able to be of very real service to the American dyestuff industry.

DU PONT AMERICAN INDUSTRIES

DU PONT DYESTUFFS

Du Pont American Industries Exhibit

We extend a cordial invitation to our friends in the textile industry to visit the Du Pont American Industries Exhibit at the Fourth Annual Exposition of Chemical Industries, Grand Central Palace, New York, the week of September 23rd. The exhibit, which will occupy Booths 7, 8 and 9 on the first floor, will contain an interesting and instructive display of over 300 products manufactured by the various Du Pont American Industries in the following lines:

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FAST COLORS ON WOOLEN CLOTHS WITH AMERICAN DYES

THE term "fast colors" is relative, no color being absolutely permanent. Therefore a color may be said to be fast when it does not change materially during the useful existence of the material that has been colored. Colored wool being used chiefly in the manufacture of wearing apparel, as far as the lay public is concerned, is dyed fast when the color does not fade materially during the life of the garment, does not rub off or smut, and withstands the necessary cleansing processes. The manufacturer must not only have the color of his finished goods of a satisfactory fastness; he must also have a color that will withstand the manufacturing process to which the wool is subjected in making a finished fabric. Therefore a dyestuff may be used to produce a fast color on cloth that should not be used for coloring loose wool, slubbing or yarn, unless it produces a color fast to scouring and fulling.

In selecting a dye a dyer must take into consideration what stage of manufacture the wool is in when the dye is to be applied, as well as what the finished fabric is to be used for. The dyer is also governed to a certain extent in the choice of dyestuffs by the fact as to whether they will dye level or not. A given dye may be sufficiently level for dyeing raw wool or slubbing, but not suitable for piece dyeing. Hence a dye is not always suitable for a given purpose, even if it possesses the required properties of fastness. The method of application and the care taken in carrying out the process affect the fastness of the color more or less. The proper preparation of the material before dyeing is also essential in the production of fast colors.

FAST COLORS ON LOOSE WOOL

Wool colored in the loose state usually has to be subjected to scouring and fulling before the fabric is finished, consequently dyes used for this purpose must be fast in this respect, the degree of fastness necessary depending on the severity of the process.

Blacks.—Fast blacks are best dyed on loose wool, by the afterchromed method, and at least two good dyes are available for this purpose, viz: Buffalo chrome black 2 B N, and Ammaco chrome black B N, the latter being of somewhat better fastness in some respects, especially to potting, although both are exceedingly good as regards general fastness.

A very satisfactory method of application is as follows: Per 100 pounds wool 5 to 6 pounds of color, 5 pounds acetic acid, 10 pounds Glaubers salt. Start dyeing at 100 deg. Fahr., raise the temperature to a boil, boil three-quarters of an hour; add 1 pound sulphuric acid (in the case of Ammaco chrome black B N a little more than this amount of acid may be required), and boil fifteen minutes longer; run off one-third of the liquor, fill up with cold water and then add 1½ to 2 pounds bichromate of soda. Raise the temperature again to a boil keep at a weak boil for one-half hour.

In the case of Buffalo chrome black 2 B N, if too much sulphuric acid or bichromate of soda is used, or the boiling is too long and severe after the bichromate of soda has been added, the shade of black obtained is likely to be brownish or rusty.

Blues.—Rich navy blues of fair fastness can be obtained with Ammaco chrome blue 3 R Y N, and Ammoca chrome blue G N. These colors are best applied on a mordant of bichromate of soda and tartar, dyeing with the addition of acetate of ammonia to the dyebath; start the dyeing at a low temperature, raise gradually to a boil and boil one to one and one-quarter hours.

A blue of still better fastness can be produced with Ammaco chrome blue B double, applied as above, or by the top-chrome method, shaded with a small amount of acid violet 4 B S. This lat-

ter color should only be used in small quantities as a shading product, as the fastness to light is only moderate. In this particular case, however, the combination of Ammaco chrome blue B double with a small amount of acid violet 4 B S produces a color of exceedingly good fastness to light, as the violet when it fades turns redder, which is offset by the blue, which fades towards the green.

Another blue coloring matter suitable for dyeing wool is Buffalo cyanone 3 R, the application of which is more simple than the above mentioned blues dyes, it being dyed with the addition of acetate of ammonia and either with or without the addition of a small amount of bichromate of soda to the bath. The color obtained possesses good fastness to light, scouring and fulling, but is not fast to steaming and decatizing, and should not be used where these requirements are necessary.

Greens.—A fast green can be dyed on loose wool with serichrome green B applied by the afterchromed method, shaded if necessary with Alizarol yellow 3 G, or Ammaco chrome yellow G W. If fastness to fulling against white cotton is not required, Erie green M T may be used. Fast bright greens are not yet obtainable.

Yellows.—There are several makes of yellow dyes which produce colors of satisfactory fastness.

Reds.—Alizarine is now being made in fairly large quantities, and a very fast Bordeaux shade can be dyed with same on a chrome mordant; on a sulphate of alumina mordant, a fast red. Bright reds of fair fastness are dyed with cloth red R, cloth red B, Erie red 4 B conc. This latter color stains white cotton on fulling.

Browns and the Government olive drab are being satisfactorily produced with combinations of chrome brown M W, Alizarol G W, Ammaco chrome black B N, or Ammaco chrome blue B double. The fastest results are obtained with this combination when dyed by the top-chrome process.

FORMULA FOR OLIVE DRAB

The following formula is being largely used for the production of the Government olive drab: Per 100 pounds wool 18 ounces Ammaco chrome yellow G W, 7 ounces Ammaco chrome black B N, 7 ounces Alizarol brown R B, 5 pounds acetate of ammonia. Start dyeing at 100 deg. Fahr., raise temperature to a boil, boil one-half hour; add 2 pounds acetate acid and boil fifteen minutes longer. Add ½ pound sulphuric acid; boil fifteen minutes longer. Then add 1 pound of bichromate of soda and boil one-half hour longer.

SLUBBING AND YARNS

All of the above mentioned dyes are suitable for dyeing slubbing, although for dyeing this material in a circulating machine with Ammaco chrome blue 3 R Y N and Ammaco chrome blue G N, the color should be dissolved with a little ammonia and added from as dilute a solution as possible.

Worsted and woolen yarns can also be dyed with the same coloring matters. In the case of carpet yarns a greater variety of fast shades is obtainable, as the chief requirement is fastness to light, although colors that are fast to street dust and mild alkaline sponging are desirable. Woolen and worsted carpet yarns are usually dyed in this country with acid colors, although for special work where extreme fastness to light, alkaline street dust, and even in some cases cleaning with a strong soap solution are required, chrome colors are used.

The following acid dyes, which are suitable for carpet yarn, produce colors of good fastness to light: Buffalo black N B R, Ammaco acid green M, crystal orange 2 G, Buffalo fast crimson R, croceine scarlet M O O, brilliant scarlet 3 R, wool yellow extra conc.

The dye that is lacking and needed

FRED WETZEL & CO. N.Y.

badly by carpet and rug makers, as well as by the woolen piece dyers, is a blue of the alizarine blue S A P type. It is expected that a color of this nature will be on the market in the near future.

The dyeing of fast colors on woolen or worsted piece goods in some respects, especially as regards level shades, is more difficult than dyeing loose wool or yarns. On the other hand, the dyer has a greater variety of dyes to choose from, as those may be used which are fast to light but do not possess special fastness to scouring or fulling.

Fast medium and dark shades are satisfactorily obtained on woolen or worsted piece goods with the chrome colors mentioned above. Light shades being more difficult to dye level, are best dyed with a combination of Alizarol brown R B, Ammaco chrome yellow G W, Ammaco chrome blue B double, either by the top-chrome method or on a chrome mordant.

ONE-BATH METHOD

Another satisfactory way to dye light shades with chrome colors is by the so-called one-bath method; that is, by adding directly to the bath the bichromate of soda, or neutral chromate of soda, and acetate of ammonia immediately after the color solution has been added. The following combination works satisfactorily by this method: Alizarol brown R B, Alizarine red B W, Ammaco chrome yellow G W, Buffalo chrome black 2 B N.

Ladies' dress goods, flannels and broadcloths are usually dyed with acid color. Medium and dark shades of fair fastness are obtainable with this class of dyes. Fast light mode shades similar to the popular "taupe" cannot be produced, owing to the lack of a fast level dyeing acid blue. As soon as this type of color is available shades of this description can easily be dyed, as a fast yellow and red, the other components of such shades, are now to be had.

Blue serges for ladies' dress goods are of better fastness than most of those dyed previously with German dyes, as they are now dyed with chrome colors and other fast-to-light colors, where formerly acid colors of only moderate fastness were very often used.

Worsted piece goods containing silk effect threads have in both ladies' and men's wear been more or less popular the last several years. This class of goods can be dyed in a full line of shades fast to light, and the equal in every respect to those formerly produced with German dyes.

The addition at the works of the Westmoreland Chemical & Color Company, Twenty-second Street and Allegheny Avenue, Philadelphia, Pa., will be equipped for the dyeing of khaki for the Government. The structure will be two stories, about 25 x 40 feet.

The Sunbeam Chemical Company, West Fifteenth Street, Chicago, Ill., has commenced the erection of a new works at Cable, Wis. The plant will include a main factory, about 75 x 300 feet, boiler house and other structures.

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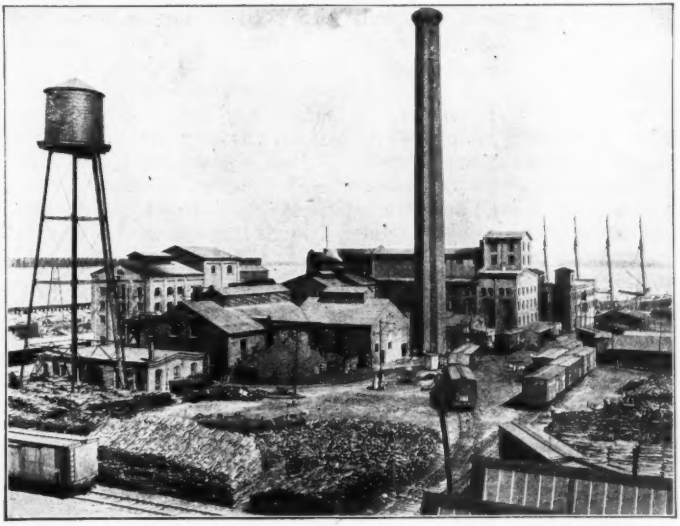

The Riverside Mills at Chester, Pa.

of

American Dyewood Co.

New York Boston Philadelphia
Hamilton, Ont.

STEAM ECONOMY IN LOGWOOD BLACK AND KHAKI

By A. Attwood

THE coal question becomes more and more serious, and correspondingly steam economy becomes increasingly of importance. We are afraid that the argument of the pocket has not hitherto had as much effect as might have been expected, because it has been countered by a rise in prices. Also, up to now, supplies of coal have met requirements. If supplies, even at a price, are going to be unavailable to meet customary requirements, then we shall see the economy campaign pursued with ardor. Efforts will be turned in a new direction. In place of endeavors having for object an increased price to cover increased cost, there will be an attempt to make less coal do as much, or even more, work than previously.

It is certain that much waste of steam is going on. There is present-day practice where every lot is done in fresh liquor—even every chroming—and where the proportion of liquor is up to 4 gallons per pound of wool. Anything over 1 gallon per pound should be considered inefficiency. By this we mean that in the actual dyeing operation there should not be more than 1 gallon to the pound. If the liquors are used over again, with just a little added each time to allow for what the wool absorbs, the final proportion should be less than 1 pint. No definite figures can be given, because the classes of wool vary so extremely, but we have known 1,300 pounds of strong English wool dyed khaki in 500 gallons of water. Of fine botany wool between 700 pounds and 800 pounds could be done in the same quantity of water—or even less. Logwood black can also be dyed level in these proportions. We hazard a conjecture that many dyers could not say offhand what proportions they employ. A measuring-up of all machines would be a first step in tackling the problem of bringing proportions down, and we fancy that any firm with a fair number of machines would find a surprising discrepancy in the different capacities. Machines that look about alike and are treated as of equal size may easily vary by 100 gallons in their liquor content.

Present Opportunity

The present is, in one sense, a good time for experimenting, because trade is considerably simplified and customers' crotchets are not so important as once upon a time. On the other hand, new machinery is hard to get; simple and cheap modifications of plant are easier to arrange. At any rate, methods of dyeing can be experimented with. Khaki and black form the bulk of work at the moment. It may seem impossible to suggest great improvements in these. Logwood black especially—a centuries-old dye—ought by now to have got to the height of efficiency in its dyeing procedure. Yet we hope our remarks may show that the limit of improvement has not been reached

Khaki is being dyed by three main methods. The first may be described as one bath, one stage. Color and chrome are added together, the bath is heated to the boil gradually and kept boiling one hour or thereabouts, when the operation ought to be complete

The second process is one bath, two stages. Color and acid are added first, and after an hour's boil chrome is added. This takes a little longer than the first process, but not much; and it generally compares very favorably in cost of dyewares. This is because exhaustion is better.

The third process is a two-bath method. The wool is first chromed,

then washed off and dyed up in a separate bath. This is used chiefly when fustic forms the main body of the khaki shade. It was also used in the early days of the war, because it admitted of the employment of logwood for shading purposes. The gradual increase in price of fustic and the prohibition of logwood for khaki have caused this third process to diminish in importance.

Logwood black is essentially a two-bath dyeing. One-bath methods are only of laboratory interest. We do not know of any firm dyeing logwood black in one bath on the large scale. Whatever economy of steam and time could be shown is far overbalanced by the extra dyestuff needed, the poorer result as regards rubbing and the liability of the bath going wrong.

We will discuss logwood black dyeing first. The following is in actual practice to-day:

1. Chrome.
2. Let off and wash off.
3. Take out of the chroming vessel and enter into a logwood liquor in another vessel. Set to boil and boil one hour.
4. Let off and wash off.

It will be noticed that both chrome and dye liquor are only used once. The procedure is adopted for loose wool when dyed by hand in open becks. The liquor will probably work out at 4 gallons per pound. The waste of steam is enormous. The only set-off against it is that the vigorous boiling exhausts the liquors very well.

Hank Dyeing

When the wool is in hank form—either stripping or yarn—it can be lifted out each time. The chrome liquor and logwood liquor only require a few gallons for replenishing purposes each time. The steam economy is thus rather good, and compares with much machine practice. The first time a liquor is used it shows a high proportion of the wool, but at the day's end, or whenever it is let down the drain, after anything from six to ten panfuls have been dyed in it, it shows up quite respectable. Figures like the following may be taken as a sample, but, of course, open pan work varies tremendously in sizes of pans, weight per panful and quantity of wool.

Average weight of wool per panful	140 lb.
First panful	600 gal.
Second to tenth panful, each	50 gal.
(To replenish what the wool takes out.)	
Ten panfuls	1,400 lb.
Water, 600 gal. $+ 9 \times 50 =$	1,400 lb.
Or about 1 gal. to 1 lb.	

As some discount to this, it must be remembered that open pans expose a large surface to the air, and the actual dyeing temperature is well under the boil, the result not being quite so clean. Where hand methods fail with this form of material, is more in other aspects. The material, for instance, cannot be boiled while in the liquor, or it will felt and mat. Because of this, the exhaustion is not as good. There is not much loss of chrome or logwood, because what is left in one liquor goes towards the next, but the goods are not dyed quite so fast and clean. Then again, the turnout is not as large as with a machine. The economic difference is not so great as might be imagined. Repairs, renewals and depreciation take a great deal of discount from machinery, and compared with other branches of the textile trade the machinery of the dyeing branch has not made hand work look quite so foolish.

Except for the labor economy resulting from the dyeing of large

weights at once, there is a good deal of machine practice that otherwise displays very little economy. It is usually possible to give the wool a good boil in machines, so that results are cleaner than open pan work, where it is not possible to keep steam on during the dyeing. No machine, of course, ought to be without re-

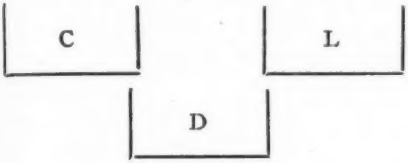

Fig. 1

serve tanks, though it is a rule with sadly too many breaches in its observance. But what we specially wish to point out is that the ordinary method of utilizing reserve tanks is not as efficient in steam saving as is usually thought to be the case. Compared, for instance, with the hand method of dyeing tanks, as previously described, it does not show a striking superiority. Startling as this may be, we think a little thought will demonstrate this surprising contention.

Let Fig. 1 be a conventional drawing of a dyeing machine D, with two reserve tanks C and L (used for chrome and logwood liquor respectively). For the purpose of our argument it does not much matter what type of dyeing machine is represented at D. Procedure is as follows: While the machine is being filled with wool, loose or in the top or ruled into hank, just as the case may be, the reserve tank C is filled with water and boiled and the requisite amount of chrome added. When ready the liquor in C is let down into D, which, of course, is cold. The boiling liquor from C parts with some heat to D, and if the machine is embedded in the floor the surrounding earth also is warmed up. In the result the temperature of the chrome solution falls from 212 deg. Fahr. to, say, 180 deg.

Steam is turned on, and the boiling point will be reached in perhaps a quarter of an hour—or maybe half an hour. Whatever it takes in steam and time gives a rough measure of the loss of heat and the cost of replacing it. After boiling one hour the chrome liquor will be pumped back. But tank C has been cooling for over one hour, and some of the heat which we are trying to save, stored up in the liquor, is spent in heating the reserve tank up again.

Having pumped all the chrome liquor out of D, the next thing is to wash off. This is done with cold water. The chroming had heated the dyeing machine and a good deal of its surroundings. Now we cool it again. Meanwhile the logwood solution in the reserve tank L is ready boiled, and when the wool is washed off the dye liquor is let down. Some of its heat is at once used—perhaps we might say wasted—in warming up the machine D and its surroundings again. Another quarter or half hour will be necessary to bring the cooled liquor back to the boil. Boiling then proceeds for another hour or so, and the liquor is pumped up into tank L. This tank has in the meantime been cooling, and at once robs the pumped-up liquor of some of its heat.

The dyed material is ready for removal from the machine, but it is too hot to handle, so it is washed off again with cold water, whereby the machine and its setting are again cooled down. Then it is emptied and filled. Things are now ready for chroming again, but note that for the past two or two and one-half

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hours the tank C has been radiating heat, and before the liquor in it is ready to be let down into the machine it will require more steam to heat it again.

Also from now onward through the chroming process the reserve tank L is losing heat In fact, when one looks at it with hypercritical observation the whole thing is an in-

Fig. 2

genious arrangement for dissipating heat. From the steam consumption point of view the chief recommendation will probably lie in the small proportion of water to wool. Otherwise the method is evidently susceptible of great improvement.

One way of getting better results is to let the two reserve tanks serve for two dyeing machines. Luckily, logwood black is done in such quantities that it should be generally possible to work two machines together in the manner about to be described. The references are to Fig. 2.

The chrome liquor is boiled up in tank marked C and let down into D. When finished with here it is pumped straight into H, which must, of course, be ready for it. While chroming is proceeding in H, the lot in D is washed off and dyed with logwood solution which has been prepared in L. When the chroming in H is finished the liquor is pumped up into C, and the wool washed off. Dyeing in D has been continued up to this moment, and the logwood liquor is now pumped across into H. The material in D is washed off and the machine emptied and filled. The chrome liquor in C is let down into D, and the cycle of operations is repeated.

This arrangement does certainly save some steam. If all goes like clockwork the time spent by boiling liquors in the reserve tanks may be reduced by as much as 75 per cent.

The way to adopt an existing plant so as to be worked as described will vary according to circumstances. A pipe may be made to connect directly the two pumping-up pipes. Valves will have to be put in above the two junctions so that the liquor can be stopped from going forward (upward) into the tank. This would make the most direct path and so save most heat. Another way is to have a let-off pipe to each machine from each reserve tank. The liquor would then first enter the tank and immediately flow out to the other machine. If tanks C and L are close together and the pumping-up pipe goes above them, an elbow joint would allow either to be filled and also by means of a movable pipe with a funnel top the liquor need not go into either of the tanks, but directly back into whichever machine it was wanted for.—*Dyer and Calico Printer.*

(*To be concluded*)

THE FOURTH LIBERTY LOAN

This week sees the beginning of a campaign for the Fourth Liberty Loan —the greatest loan which any nation has ever attempted to float. The dyestuff industry should take upon itself a major part in assuring the success of this flotation. Our Government has done much for the industry, and we hope it may do more. The time will come in the not-far-distant future when Government assistance of various kinds will be, if not absolutely essential, at least extremely important to our dyestuff manufacturers. Let us then put ourselves in the position of having supported the Government most loyally in its endeavors, to the end that we may reasonably ask for reciprocal favors.

The September issue of *The Barrett Trail*, published by the Barrett Company, bristles with illustrations and is full of snappy sketches about Barrett men at the front and in the camps in the United States. Additions to the company's long roll of honor since July 20 are printed.

Important Chemicals Utilized in Bleaching, Dyeing, and Calico Printing, Thickenings, etc.

PART IV

THE tannins which are most important in the dye house are the following: Tannic acid, or gallo-tannic acid, which is found in many parts of plants holding tannin, particularly gall nuts, and in the pure sumac, and is obtained principally from the gall nuts in Eastern Asia, which are very rich in tannic acid. It is sold in the form of a light colored powder, or of yellowish to brownish scales, or, again, as a brittle glassy substance of the same coloration, or as a foamy mass. When exposed to the air it gradually becomes darker. It dissolves in six times its weight of cold water, and more easily so in hot water; in dilute alcohol, dilute acetic acid, or glycerine it dissolves very freely. The aqueous solution decomposes gradually when left standing. Alkaline solutions become strongly discolored. The better kinds of commercial tannic acid contain about 65-85 per cent tannin; the well-known brand of foaming tannic acid is almost chemically pure. Good tannic acid yields a clear solution in water, and on being reduced to ashes leaves but little residue. There are, however, very good qualities on the market which do not yield a perfectly clear solution in water. Pure gallo-tannic acid yields a clear solution in a mixture of equal parts of alcohol and ether, while most of the impurities and adulterations, gallic acid excepted, are not dissolved thereby. Gall nuts, or gallo, are ball-shaped abnormal growths caused by the sting of insects when depositing their eggs. They should be collected before they have been pierced by the young insect. Of the oak-gall nuts the green or black Aleppo and Levante gall nuts are the best, which contain about 5-60 per cent gallo-tannic acid. The Hungarian, Italian, French and German gall nuts are very much poorer in tannic acid. The Chinese and Japanese galls are very important, and contain up to about 80 per cent gallo-tannic acid, and are used principally for the manufacture of pure tannic acid. Knoppern are gall nuts from an oak growing in Austria which contain only 25-35 per cent gallo-tannic acid, and are not much used in the dye house. Sumac is, next to pure tannic icad, the tannin most generally used in cotton dyeing. The sumac obtained from Rhus coriaria is the best, and contains gallo tannic acid. The finest quality, and at the same time the least colored, is the Sicilian sumac; next to it comes American sumac, which has gained greatly in quality during the last few years, as well as the Greek, Spanish and Portuguese sumac. Of less value are the sumacs from coriaria myrtifolia, and rhus colinus obtained in Hungary, the Tyrol and Provence. Commercial sumac usually consists of the whole broken up, or sometimes powdered leaves of the plant; the stalks of the leaves are very often mixed up with the rest. The good kinds have an olive-green color, and a fresh agreeable smell; they contain 15-20 per cent, even sometimes more than 20 per cent tannin. Sumacs which are dull in color, and have a musty smell, have deteriorated by moisture and too long storing. Sumac is used principally as a tannin for dark shades. The dull red color which the sumac contains usually interferes rather with light and brilliant shades.

Sumac extract is marketed as a thick, dark brown liquid of about 52 deg. Tw., or in a solid state. Decolorized sumac extracts may, as a rule, replace the tannic acid even for bright shades. Liquid sumac extract is rather disposed to ferment, losing thereby in strength. Myrabolans are the fruit of various Chinese and East Indian plants, which are sold in a dry state, and ground down to powder. They contain about 25-45 per cent ellagitannic acid, and also a yellow brown dyestuff. In cotton dyeing it is

sometimes used for dyeing the warp black in half wool pieces, and for covering noils.

Valonicas are the acorn cups of certain species of oak growing on the Mediterranean coast, which contains 25-35 per cent tannin, probably gallo-tannic acid, as well as a dirty colored yellow dyestuff. They are sometimes employed similarly to myrabolans. Divi-Divi, or Libi-Divi, are the pods of certain plants growing in Central and South America which contain about 19-35 per cent ellagitannic acid, and are used in the same manner as myrabolans. The above-named tannins, as also several others, are employed largely for dyeing cotton, and for weighting silk, more particularly black silk.

The value of the tannins varies a great deal, according to the amount of tannic acid they contain. It is immaterial in estimating their value whether they contain gallo-tannins or ellagitannic acid. For many purposes the amount of dirty dyestuff contained in the tannins is likewise a consideration. When stored for a long time, principally in damp, close places, the tannins are deteriorated through the decomposition of the tannic acid. The value of the tannins is best determined by an exact titration with permanganate, and by making dye tests. For testing by dyeing, dissolve carefully weighed quantities of the tannin to be tested and of that with which it is to be compared (of pure tannic acid about 0.3 grams), in hot water. Fill up with water up to 250 c.c., add 10 grams common salt and 2½ c.c. glacial acetic acid (or about 5 c.c. good acetic acid in each vessel, and mordant therein 10 grams of cotton yarn previously well boiled for three hours, the liquid meanwhile being allowed to cool off; then wring off each hank by itself, without, however, rinsing, and turn them in a glass containing 200 c.c. nitrate of pyrolignite of iron of 1½-3 deg. Tw. for fifteen to twenty minutes; rinse and dry. The strength of the tannin is then determined from the depth of the shade of the cotton. In order to determine how the material is suited for light shades fix it with antimony instead of iron salts, and dye with basic colors; for instance, new methylene blue G. G., or irisamine G.; it will then be found that one tannin is sometimes more suited for blue and another more for red shades.

Dextrine is prepared by heating starch, chiefly potato starch, with dilute acid, and is sold as white and yellow dextrine. White dextrine contains a good deal of the original starch in an unchanged condition; yellow dextrine, on the other hand, only very little of it. Both kinds, further, contain grape sugar, and are sometimes also adulterated with sand, gypsum, etc. The amount of starch is determined in dextrine by dissolving it in cold water, and ascertaining the weight of the residue, deducting the weight of any ash that may be found on igniting. The various other kinds of burnt starches are tested in the same manner. Good dextrine is not hygroscopical, dissolves in cold water with but little residue, and must not react acid. Dextrine possesses only one-fifth to one-sixth the thickening

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power of wheat starch, but, on the other hand, the print pastes prepared with it are much smother than those of wheat starch. The value of starch is determined by the stability and thickening property of the paste. Its thickening power and finishing properties are determined comparatively by practical tests. Insoluble mineral, and other impurities are recognized if the starch is liquefied with diastafor, in which case such impurities remain undissolved. By treatment with dilute acids, or by heating to 200-260 deg. C. (400 to 500 deg. Fahr.) starch is converted into dextrine. By the addition of diastase (malt diastafor) it is turned into dextrine and maltose. Through the action of caustic soda lye it is converted into apparatine, which is sometimes used with good results for thickenings, but more particularly for finishing sizes. For the production of thickenings the starch is stirred to a paste with a little water, the remainder of the water being then added, and the solution gradually brought to the boil, and boiled for fifteen to twenty minutes. If the boiling is continued too long the starch paste will become thinner again and lose its thickening power.

Of the different kinds of starch wheat starch is the most largely used as a thickener. It possesses very strong thickening power, and the print colors prepared therewith penetrate the material well. Wheat starch, it should be noted, must be free from bran, which is very apt to block the engravings. Bran may be detected by stirring the finely ground starch to a thin, even milky fluid and passing through a very fine silken sieve; the bran will then remain in the sieve. Maize starch possesses still greater thickening power than wheat starch, but does not keep so well. Although especially well suited for alkaline print pastes and discharge colors, it is principally used for finishing. Rice starch is sometimes used as a thickener for print colors for flannelettes, but its principal application is for finishing purposes. The paste prepared from rice starch absorbs water readily, and it is nearly always sold free from any sand. Potato starch is employed principally as a cheap substitute for the already named qualities of starch for finishing purposes. It is but little suited for thickening print colors. Flour, particularly wheat flour, is at times employed as a thickener either by itself or in combination with wheat starch. It is particularly well suited for the thickening of ice colors (paranitraniline red), and is further used in the printing of wool yarn. Thickenings prepared with flour do not keep as well as pure starch thickenings. The flour must be as finely sifted as possible, and free from any bran or mineral substance; it must, further, not be damp so as to conglomerate when pressed in the hand. It is tested for its thickening power and stability in the same manner as starch. Burnt starch is obtained by roasting, by which process the insoluble starch is partially converted into soluble dextrine. The various sorts are paler or darker, according to the degree of roasting to which they have been submitted. The quality of burnt starch is determined by its color and thickening power as well as the percentage of water it contains, which should not exceed 4 per cent.

British gum is burnt maize starch, and is sold in the form of a yellowish or brownish powder. It is an excellent thickener, and can, in many cases, be used as a substitute for the more expensive ordinary gums. The colors produced by it level very well. British gum is also very well suited for chlorate discharges and reserves, both for the Prud-homme style and for colors requiring a caustic soda discharge.

We urge that the Textile Industry support the stand of the American Dyestuff Reporter for an American Dyestuff Industry.

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Leiogomme is roasted potato starch, and it is admirably adapted for strong caustic print colors.

For thickening properties and beauty of the colors produced with it, gum is best tested comparatively and colors thickened with gum yield very fine level prints, but of a considerably lighter shade than when using starch as a thickener. Gum is therefore employed more especially for printing light colors in large patterns. Crystal gum, slab, Indian gum, and gomme, labiche, etc., are excellent substitutes for the ordinary gum (arabic, senegal, etc.). They are easily soluble in water, and possess great thickening power. They are generally dissolved with their own weight of warm water, but may be diluted considerably more. Owing to their efficiency they are very economical. For very delicate shades only they are less suited than the ordinary gums, because the colors mostly turn out somewhat duller than when using senegal gum, etc. They are free from any kind of hard insoluble impurities, and they are tested by comparative print tests.

Gum tragacanth, or gum dragon, is obtained from different kinds of astragalus, and is sold either in form of flat yellowish white pieces, as leaf tragacanth, or in a bent worm-like shape, as worm tragacanth.—*The Textile American.*

The United States Government is building a $3,000,000 addition to the benzol distilling plant of the Barrett Company at Frankford, Pa., and will also build an additional power plant.

SKILL AND CARE REQUIRED IN YARN DYEING

Some of the problems met with in wool dyeing which illustrate the delicacy of handling often required are discussed in an article in the *Textile Colorist,* which is herewith reproduced from that journal.

From the Chinese point of view the dye is one of the most important considerations in the making of a rug. In western China we find that the craftsman whose family has doubtless been in the business for generations takes a greater pride in the production of a certain color than do the newly established rug men in Peking and vicinity. "Ninghsia dyes never fade," is a saying in China. Yet the native dyes used in Peking, if properly set, will outlast the carpet. Providing the dyes does his work honestly, there is nothing that has yet been discovered that will bleach the rug without ruining the fabric. The rug can be boiled to shreds without affecting the dye in the least.

Before the war, when aniline dyes were much cheaper, some native rug men preferred to use aniline dyes because it simplified the process and was less expensive. The aniline-dyed product quickly fades and will not stand the washing process. There are still some aniline-dyed products to be found, and the native rug men occasionally foist one upon the unsuspecting tourist who has the temerity to buy without the advice of an expert.

Every rug maker dyes the yarn to

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NAPHTHOL GREEN
ALIZARINE NAVY BLUE

match the colors in the designs that are submitted. At one dyeing he must make enough to finish the rug, otherwise there is a variation in the color and the rug is streaked. The yarn is dyed in large iron caldrons, in which the dye is first made. The skilled dyer times his work just as a photographer times his photographic plate. The dye should never be wrung from the skein, as this results in uneven distribution. Sometimes it is rinsed several times in cold water before it is hung up to dry. The master hand knows the exact moment when the yarn has finished drying in the sun. The dye maker has no books or recipes, but memorizes all his formulas. There is generally displayed at some place in the shop a great number of small patterns showing all the different colors and tints of which that particular proprietor is master. When a rug maker receives an order for a rug, the whole supply of yarn to be used is dyed and set. It is then displayed pending the buyer's inspection before the weavers are set to work. If a particular shade is sought the dyer will experiment until the required tint has been found.

The old Chinese rug makers, although masters in the art of color making, confined themselves to a very limited number of colors. This has been followed to a certain extent by the moderns. In the use of blues and yellows the Chinese artisan doubtless stands pre-eminent. The use of the true imperial yellow is very rare, although an endless number of shades in this color are designated imperial. The reds sometimes have a yellowish tinge or hue. There are many shades of salmon pink and reds, the salmon pink being produced from species of redwood grown in western China.

Minerals are scarcely if ever used. The dyers of Ninghsia, in Kansu, are famous for their beautiful shades of red. This color is produced from a berry grown in Kansu Province. Red is also produced from redwood. Madder (Rubia cordifolia) is a creeper whose stems and roots when ground and boiled produce a red that is used as the basis of many shades. It is also said that some of the old craftsmen occasionally use sheep's blood to produce a deep vermilion. Perhaps the best known red dye in China is the safflower (Carthamus tinctorius), called the red flower by the Chinese. The seed of this flower is said to have originally come from Turkestan.

Brown comes from the dye yam, or shu liang, as the Chinese call it. It produces a dark-brown color and is widely used in China in the dyeing of cloth. If a darker shade is desired gallnuts and alum are used. Acorn husks are sometimes used to produce this color.

Blue comes from the indigo plant. One of the many varieties which grow in China (Polygonum tinctorium) is grown in the northern provinces. The use of blue is rather a difficult and tedious process. If the work is carelessly done the blue does not go clear through and the yarn when woven into the rug and clipped

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off shows a white spot in the center of the strand. A rug made up of such yarn is very unsatisfactory. Most of the blues used by the Chinese have indigo as their basis, and this in combination with other materials produces all the shades known.

Purple is obtained from hollyhocks and from the bark of Lithospermum erythrorhizon. The coloring matter is brightest if the plant is dug in early spring.

Yellow is obtained from the buds of a large tree known as Sophora Japonica, widely scattered over China. Locus seed also produces a yellow as well as an olive green. Some craftsmen first dye the yarn a fast yellow. When it is set it is dipped in red and exposed to the air for a very long period. As a result the red fades and the yellow remains, with just a blush of red that is very pleasing to the eye. Green dyes are obtained from Rhamnus tinctoria and other species of buckthorn. Indigo and yellow produce a green dye, but this color is very little used in Chinese rugs.

Black is obtained from gallnuts. when mixed with cochineal and other substances the powder from the galls produces gray, brown and fawn tints. Black is also obtained from pomegranate rind and vinegar.

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NOTES OF THE TRADE

The Industrial Pitch & Tar Products Company, New York, has been incorporated with a capital of $20,000 to manufacture chemicals, dyestuffs, etc. C. R. Paul, D. Miller and F. J. King, 455 Ninth Street, are the incorporators.

Austin & Co. have a contract for a two-story factory building at Marcus Hook, Pa., for the National Aniline Chemical Company, and F. W. Van Loon has a contract for 100 houses at Naaman, Del., for the same company.

The J. & R. Manufacturing Company, New York, has been incorporated with an active capital of $33,000 to manufacture chemicals and dyestuffs. E. F. Randolph, G. L. Robinson and F. J. Byrne, 52 Broadway, are the incorporators.

Following the recent destruction by fire of the one-story plant of the Central Dyestuff & Chemical Company, at Plum Point Lane, Newark, N. J., this firm has had plans prepared for its reconstruction. The new structure will measure 54 x 80 feet.

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